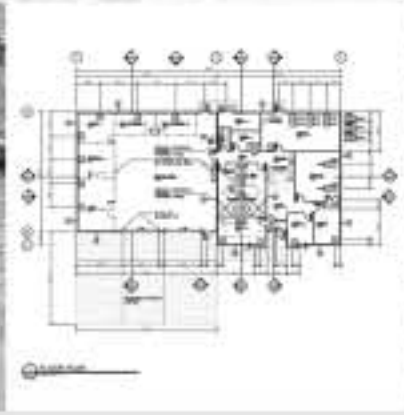
National Science & Technology Center

Providing a FOUNDATION for INFORMED RESOURCE Management Decisions

FISCAL YEAR 2003

Annual REPORT



U.S. DEPARTMENT OF THE INTERIOR • Bureau of Land Management

DIRECTOR'S MESSAGE

I am pleased to share with you the National Science and Technology Center's (NSTC's) annual report for fiscal year 2003. It is our philosophy that science provides the foundation for informed resource management decisions and technology provides the tools for obtaining accurate and science-based information. These two activities together embrace the essence of the mission of this Center. In its strategic plan, the Department of the Interior has committed to identifying current science and conducting relevant scientific investigations to guide decisionmaking. NSTC plays an important role in supporting this commitment.

NSTC works hand in hand with other BLM offices to address resource management challenges. Our specialists help investigate and test new technologies, compile the most current scientific information, develop ways to apply current science and technology in the field, and convey science and technology information to the field through direct technical assistance, training, publications, the Web, and other means.

Because NSTC's role is to provide technical support to offices requesting our assistance, the work that our professionals do is not always easy for observers to identify. Our focus is to ensure that our customers' projects are successful—not to attract attention to our contributions. This annual report is intended to share the successes we have achieved in partnership with our customers, while at the same time highlighting the types of products and services we offer.

I welcome your feedback to this annual report and any suggestions you may have regarding how NSTC can better serve the Bureau to meet our collective goals and objectives.

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ACCOMPLISHMENTS

***In fiscal year 2003**, the Bureau of Land Management's (BLM's) National Science and Technology Center (NSTC) completed a wide variety of projects for field offices in each of the Western States, including Alaska, and for the Eastern States and Headquarters offices as well. We have organized our accomplishments according to the four mission areas in the Department of the Interior's strategic plan. Some of these accomplishments overlap into other mission areas, but have been listed where they are most appropriate. These accomplishments are not all-inclusive—they are merely highlights of some of the projects we were involved in during 2003. More detailed information about our completed projects and services is available on the NSTC Web page at www.blm.gov/nstc.*

Resource Protection

- Conducted facility condition evaluations and provided technical architectural and engineering design and construction assistance for cultural and historic facilities projects, including the Swansea Townsite in Arizona, Orson Adams Ranch and Wilcox Ranch in Utah, and Lowry Ruins in Colorado.

- Produced large-scale topographic maps and digital orthophotographs to aid in the characterization and reclamation of abandoned uranium mines in the Lasal Creek watershed for the Moab field office in Utah.

- Provided digital mapping support for 24 Land and Water Conservation Fund (LWCF) projects to be incorporated within a BLM Congressional submission for appropriations funding.

- Tested new light detection and ranging (LIDAR) technology to produce digital elevation data from an area with extensive mine tailings for the Canon City field office and the Lake Fork Watershed Partnership in Colorado. With the LIDAR technology, high-quality data was obtained quickly and mitigation work was completed well ahead of schedule.

- Developed and tested a tool for conducting regional analyses of prairie grasslands to support multispecies conservation, wildlife program planning, and land use planning. This tool analyzes changing resource conditions and resource management situations at multiple spatial scales to provide information regarding habitat quantity, quality, and location.

- Created the BLM Areas of Critical Environmental Concern (ACECs) database to track location, acreage, ecotype, and other information about ACECs and Research Natural Areas.

- Compiled an extensive bibliography containing over 300 sources of information on drought issues for BLM offices in Utah; assessed drought management efforts within BLM, including cooperative efforts with State and local governments; conducted a programmatic drought science needs assessment for the Bureau; and developed a template for a BLM national drought response strategy.

- Participated in ongoing studies to protect hydrologic and riparian values associated with the San Pedro River National Conservation Area for BLM offices in Arizona and for the Department of Justice.

- Provided technical reviews of an environmental impact statement and hydrologic studies pertaining to a proposed powerplant, which would involve substantial ground water use from the pumping of several wells in an area of significant riparian habitat, for the Las Vegas field office.

- Updated lesson plans and taught the National Training Center's "Stream Dynamics and Channel Design" and "Aquatic Habitat Restoration and Enhancement" courses held in Idaho.

- Provided technical assistance on soil and water indicators of rangeland health and helped produce the "First Approximation Report on the Criteria and Indicators for Sustainable Rangelands" on the Web for the Sustainable Rangelands Roundtable. The Roundtable is a forum for representatives from industry, academic institutions, nonprofit organizations, and various levels of government.

- Assisted with the site characterization, engineering evaluation/cost analysis, and cleanup at seven abandoned mine land and hazardous waste sites, including Oregon's Poorman/Balm Creek site and Arizona's Hillside Mine.

- Provided technical assistance on cost recovery, including potentially responsible party searches; enforcement of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and settlement agreements for 15 abandoned mine land and hazardous waste sites, including the Black Rock Mine in California and Big Bend, Arizona.

- Created a poster session on the Manning Canyon tailings and published Technical Note 409, "Passive Treatment Systems for Acid Mine Drainage" and Technical Note 410, "Abandoned Mine Waste Repositories: Site Selection, Design, and Cost."

- Assisted with fund acquisition strategies, claim development, settlement negotiations, and restoration planning and implementation for eight BLM natural resource damage assessment and restoration (NRDAR) cases, including the Yerington Mine site in Nevada.

- Provided technical assistance with water quality sampling, analysis, and monitoring and compliance with the Clean Water Act for four sites, including the Grand Staircase-Escalante National Monument.

- Directed a grant for phytostabilization of abandoned mine sites in Montana, California, and Arizona, working with university partners from the Cooperative Ecosystem Studies Units Network to investigate using native plants and soil amendments to reduce health risks, stabilize mine tailings sites, and prevent the release of metals to the environment.

- Prepared soil and water conservation district maps for the National Association of Conservation Districts Conference.

- Assisted BLM offices in Alaska with interpreting aerial photos and integrating data from Ducks Unlimited to complete the assessment of proper functioning condition on the George River drainage.

- Wrote and reviewed portions of Technical Reference 1737-19, "Riparian-Wetland Soils," which describes soil components and how to assess soil productivity in riparian and wetland areas, and provided editing, design, and layout services to the National Riparian Service Team for the final publication.

- Edited, designed, and produced "America's Priceless Heritage: Cultural and Fossil Resources on Public Lands," 13 publications that describe, by State, the variety of these resources on BLM lands, why they are at risk of being damaged, and what BLM is doing to preserve them.

Resource Use

- Completed and published "Assessing the Potential for Renewable Energy on Public Lands" in cooperation with the National Renewable Energy Laboratory (NREL) and continued ongoing coordination with NREL and Argonne National Laboratory on renewable energy issues and contracts.

- Continued production on an automated 1:100,000-scale database for mapping and other geographic information systems (GIS) purposes. Automated data themes now covering 31 percent of the western United States include the Geographic Coordinate Data Base (GCDB), ownership, wilderness, transportation, hydrography, hypsography, and text labels.

- Revised and automated 69 1:100,000-scale surface/minerals management maps in support of multiple resource programs and recreational activities in 9 States.

- Revised and printed a digital version of the 1:500,000-scale Nevada State map showing complete surface ownership, the public lands survey system (PLSS), political boundaries, major transportation routes, hydrography, text labels, and shaded relief.

- Developed and tested a strategy to quickly synthesize, analyze, and interpret regional information on resource conditions and trends related to public land management issues on the Colorado Plateau. A GIS-based platform will be used to provide fast, easy, and intuitive access to the data, analyses, and results.

- Provided guidance to BLM offices in Utah on low-risk ways to cross stream channels with oil and gas pipelines and on potential toxic releases from pipeline breaks.

- Assisted with water and air quality impact analyses for nine energy development environmental impact statements and resource management plans, including the "Northern Powder River Basin Oil and Gas Environmental Impact Statement."

- Published Technical Note 412, "Analyses of Natural Gases," which reports to members of the helium and petroleum industries and the general public on the occurrence of helium in 311 natural gas samples from 13 States.

- Provided design and training assistance for the National Training Center's "Advanced Groundwater Hydrology" course, which included sessions on numerical groundwater modeling frequently used to assess potential impacts from proposed mining operations.

- Conducted well site investigations in Colorado, Arizona, and Idaho to enable the effective and safe development of ground water for livestock management.

- Provided information to all BLM field offices on soil moisture data collection and analysis techniques in support of livestock grazing evaluation under drought conditions.

- Revised, edited, designed, and produced "Creeks and Communities: A Continuing Strategy for Accelerating Cooperative Riparian Restoration and Management," which provides specific objectives, strategies, and activities to improve the effectiveness of riparian area management.

- Assisted the States with evaluating, selecting, and using software to record forest and timber inventory data in the field with hand-held data collection devices.

- Facilitated the use of GIS to interpret and analyze hydroelectric dam sites for the withdrawal process.

- Researched and developed an application for using remotely sensed data to create a three-dimensional visualization for predictive soils mapping and collaborated with the Natural Resources Conservation Service on predictive soils modeling.

- Acquired new aerial photography to support BLM's multiple-use management activities in Arizona, Idaho, Montana, and Nevada.

- Assessed timber permitting and proposed a new system to address timber and other permitting business within the BLM. The National Information Technology Investment Board (ITIB) approved further investigation of the proposal.

- Coordinated the production of digital orthophoto quadrangles (DOQs) through a 5-year interagency agreement with the U.S. Geological Survey. The DOQs will provide accurate remote resource and cultural data and enhance BLM's analysis and decisionmaking capabilities.

- Maintained and updated data and completed data migration and storage for the Bureauwide Satellite Imagery Archive.

- Provided technical consultations on GIS and remote sensing issues for the National Training Center's Lands and Realty Academy.

- Reengineered business processes and established business requirements for the future construction of a new automated wild horse and burro herd management, veterinary services, and animal adoption processing system.

- Revised and edited "Adopting a Wild Horse or Burro," a brochure for members of the public who are interested in wild horse and burro adoption.

- Provided technical assistance for BLM's national ePlanning initiative, which focuses on delivering fully integrated planning information to the public. This assistance included conducting an ePlanning pilot and testing the first "time-sensitive plan," which enabled the public to submit comments online and have real-time interaction with BLM during the land-use planning process.

- Instructed 8 sessions of the National Training Center's "Rangeland Administration System" (RAS) course, which provided training to over 120 RAS users and managers.

- Proposed and initiated vegetation classification prototypes representing both dunal and prairie grassland ecosystems in support of threatened species and recreational activities.

- Created exhibits, poster sessions, and handouts on soil biological communities, big game habitat, wild bird habitat, prairie grassland, riparian restoration and management, water conservation, grazing management, sustainable minerals development, and other subjects to help educate special interest groups and the general public about emerging technology, new applications, and current projects.

- Revised and republished Technical Note 397, "Wildlife Water Catchment Construction in Nevada" and Technical Reference 1737-16, "Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas."

- Produced "BLM Library Update," a monthly listing of recent books and articles pertaining to natural resources and circulated over 3,000 titles from these listings.

- Provided Bureau employees Internet access to over 50 full-text, natural resources journals and 17 databases.

- Published nine Resource Notes to share new technology, unusual field applications, specialized resource information, or significant technical developments in BLM. There are now 67 Resource Notes available on the NSTC Web page.

- Located and distributed over 6,500 requested books, articles, conference proceedings, and other publications pertaining to natural resources, recreation, and various other topics.

- Conducted research and produced bibliographies on numerous subjects, including various plants, off-highway vehicle (OHV) trail impacts, wildlife inventories, and the National Historic Trails program.

- Summarized the Bureau's wind energy policy for the proceedings of the American Wind Energy Association Conference and created a display about the implementation of the President's energy policy.

- Revised, edited, designed, and laid out "Public Rewards from Public Lands," a set of 13 reports that highlight BLM programs and provide State and national statistical information on collections, financial transfers, investments, and commercial and recreational use of public lands and resources.

Recreation

- Provided predesign scoping, programming, feasibility, and concept assistance and developed final designs and contract documents for 13 recreation sites and 6 visitor facilities.

- Managed construction activities for a new administrative complex in Caliente, Nevada.

- Managed planning and design activities for new visitor centers at Pompeys Pillar in Montana and California Trail and Red Rock in Nevada.

- Completed feasibility level designs for a new environmental education center in southern Nevada.

- Created large-scale topographic maps for planning interpretive and recreational facilities at archaeological and historical sites in Monticello, Utah; Buffalo, Wyoming; and Billings, Montana.

- Created large-scale topographic base maps to aid engineers in the development and maintenance of six recreational facilities in Lake Havasu and Yuma, Arizona.

- Created route inventories (including OHV trails) for use in resource management planning in Nevada and Arizona.

- Coordinated with the U.S. Forest Service's Technology and Development Committee on the continued development of recreation-related technology that will serve the needs of both agencies.

- Provided technical input that was significant to the completion of the Meadowood proposed planning analysis and environmental assessment and the progress of the recreation activity plan. Meadowood is a Special Recreation Management Area near Washington, DC.

- Conducted well site investigations in Arizona, Utah, and Nevada to enable the effective and safe development of ground water for recreational sites.

- Provided technical advice to BLM offices in Utah on potential recreation area and stream rehabilitation issues pertaining to Range Creek.

- Developed and consulted on streamflow and geomorphic analyses related to the Lower Crooked River, a National Wild and Scenic River in western Oregon.

- Developed enhanced techniques for using remote sensing to collect OHV route data and conducted workshops on using these techniques to create and update route inventories in Arizona, New Mexico, and Colorado.

- Coordinated with NASA's Stennis Space Flight Center for a large purchase of high-resolution satellite (Quickbird) data. The Glennallen, Alaska, field office used the data to make recommendations pertaining to off-road vehicles for a resource management plan.

- Helped develop the design and produced the layout for "Adventures on America's Public Lands" in partnership with Smithsonian Books and BLM's Environmental Education and Volunteers Staff. This guide highlights diverse recreational opportunities on 178 BLM-managed sites in 20 States and features 190 color maps, 231 color photos, 18 activity overviews, and complete visitor information.

Serving Communities

- Developed standard designs for fire facilities, including designs for crew quarters, an air tanker base operations center, and an engine garage and operations center.

- Provided predesign scoping, programming, feasibility, and concept assistance; final design development; and contract document services for 25 wildland fire program construction projects.

- Provided project management and contracting services for the planning, design, and construction of administrative office buildings in Rawlins and Rock Springs, Wyoming, and Craig, Colorado.

- Managed construction activities on three new fire facilities in southern Nevada.

- Led or provided support for 11 national engineering projects for BLM's Headquarters office, including bridge and dam seismic safety programs, facility condition assessments for administrative and recreation sites and roads, facility energy conservation and management efforts, and facility asset management system development.

- Provided architectural and engineering design and construction assistance and other technical assistance to field offices on 35 projects, including bridge inspections in 4 States, 2 value engineering studies, and several facility condition evaluations.

- Managed 19 projects contracted to architecture and engineering consulting firms.

- Led Bureauwide efforts to develop computer aided design and drafting (CADD) standards, guide specifications, and design guidelines.

- Developed a pilot Web site that provides field offices access to geographic and other archival data from BLM's extensive aerial photography archive housed at NSTC.

- Located, reproduced, and distributed copies of aerial photos of BLM lands from the aerial photography archive for BLM offices, other government agencies, and the public.

- Participated on the National Digital Orthophoto Program's technical committee to help evaluate both the changes in orthophoto technology and the effects the changes have on the program's participating agencies.

- Worked with the National Digital Elevation Program's interagency team to write and design guidelines for acquiring elevation data.

- Worked with an interagency advisory team to design and write guidelines for digital orthoimagery, which is one of the basic geospatial data themes as defined by the Geospatial One-Stop initiative.

- Designed and completed a contract to acquire digital orthoimagery for the Farmington field office.

- Taught a course in lake, wetland, and terrestrial ecosystem ecology at Sisseton Wahpeton Community College, a tribal college in South Dakota.

- Provided technical assistance and project management, technical and regulatory compliance, and contracting support for the evaluation and cleanup of 18 hazardous waste sites, including the Caselton tailings site in Nevada.

- Participated in a collaborative effort among BLM and the National Park Service, Natural Resources Conservation Service, Forest Service, and Utah State University to develop a course entitled "Using Advanced Technologies for Soils Mapping."

- Completed work on BLM's Wildland Fire Geospatial Strategic Plan.

- Created GIS products for the Department of the Interior's Office of Wildland Fire Coordination to use in Congressional reports and hearings and provided fire perimeter data for the "GeoMAC" and "Federal Fire History" Web sites.

- Developed the "Library Management for Records Managers" module for the National Training Center's new records management course.

- Reproduced microfiche of cadastral survey notes and plats for BLM offices and members of the public.

- Designed, edited, and produced the annual National Public Lands Day (NPLD) posters and brochure to encourage Americans to volunteer their time to maintain and improve public lands and open spaces. NPLD is a cooperative effort involving more than a dozen governmental and private partners.

- Edited, designed, and laid out "Balancing Today's Needs for Tomorrow's Public Lands," the Bureau's 2002 annual report, and "Guardians of the Past—Stewards for the Future," Eastern States' 2002 annual report.

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